

67,200-641  
2001-0481

CLAIMS

What Is Claimed Is:

1. A method comprising:

plasma treating a semiconductor wafer having at least one photoresist layer; and,

after plasma treating the semiconductor wafer, measuring one or more critical dimensions on the at least one photoresist layer using an electron beam,

such that plasma treating the semiconductor wafer prior to measuring the one or more critical dimensions using the electron beam substantially prevents shrinkage of the at least one photoresist layer when using the electron beam.

2. The method of claim 1, wherein plasma treating the semiconductor wafer increases ion dosage of the at least one photoresist layer, increasing resistance of the at least one photoresist layer to shrinkage when using the electron beam.

3. The method of claim 1, wherein plasma treating the semiconductor wafer comprises plasma curing the semiconductor wafer.

4. The method of claim 1, wherein plasma treating the semiconductor wafer comprises plasma etching the semiconductor wafer.

5. The method of claim 1, wherein plasma treating the semiconductor wafer comprises high-density plasma etching the semiconductor wafer.

6. The method of claim 1, wherein the at least one photoresist layer comprises an Argon Fluoride 193 nanometer photoresist layer.

7. The method of claim 1, wherein the at least one photoresist layer comprises a Fluoride 157 nanometer photoresist layer.

67,200-641  
2001-0481

8. The method of claim 1, wherein measuring the one or more critical dimensions using the electron beam comprises critical dimension scanning electron microscope (CD-SEM) measurement of the one or more critical dimensions.

9. The method of claim 1, wherein measuring the one or more critical dimensions using the electron beam comprises after-development inspection (ADI) of the one or more critical dimensions.

10. The method of claim 1, wherein measuring the one or more critical dimensions using the electron beam comprises after-etching inspection (AEI) of the one or more critical dimensions.

11. A method comprising:

plasma treating a semiconductor wafer having at least one photoresist layer; and

after plasma treating the semiconductor wafer, measuring one or more critical dimensions on the at least one photoresist layer using an electron beam,

such that plasma treating the semiconductor wafer prior to measuring the one or more critical dimensions using the electron beam substantially reducing shrinkage of the at least one photoresist layer when using the electron beam.

12. The method of claim 11, wherein plasma treating the semiconductor wafer increases ion dosage of the at least one photoresist layer, increasing resistance of the at least one photoresist layer to shrinkage when using the electron beam.

13. The method of claim 11, wherein plasma treating the semiconductor wafer comprises plasma one of curing, plasma etching, and high-density plasma etching the semiconductor wafer.

14. The method of claim 11, wherein the at least one photoresist layer comprises one of an Argon Fluoride 193 nanometer photoresist layer and a Fluoride 157 nanometer photoresist layer.

67,200-641  
2001-0481

15. The method of claim 11, wherein measuring the one or more critical dimensions using the electron beam comprises one of: critical dimension scanning electron microscope (CD-SEM) measurement of the one or more critical dimensions; after-development inspection (ADI) of the one or more critical dimensions; and, after-etching inspection (AET) of the one or more critical dimensions.

16. A semiconductor device fabricated at least in part by performing a method comprising:

plasma treating a semiconductor wafer having at least one photoresist layer; and

after plasma treating the semiconductor wafer, measuring one or more critical dimensions on the at least one photoresist layer using an electron beam,

such that plasma treating the semiconductor wafer prior to measuring the one or more critical dimensions using the electron beam decreases shrinkage of the at least one photoresist layer when using the electron beam.

67,200-641  
2001-0481

17. The device of claim 16, wherein plasma treating the semiconductor wafer increases ion dosage of the at least one photoresist layer, increasing resistance of the at least one photoresist layer to shrinkage when using the electron beam.
18. The device of claim 16, wherein plasma treating the semiconductor wafer comprises plasma one of curing, plasma etching, and high-density plasma etching the semiconductor wafer.
19. The device of claim 16, wherein the at least one photoresist layer comprises one of an Argon Fluoride 193 nanometer photoresist layer and a Fluoride 157 nanometer photoresist layer.
20. The device of claim 16, wherein measuring the one or more critical dimensions using the electron beam comprises one of: critical dimension scanning electron microscope (CD-SEM) measurement of the one or more critical dimensions; after-development inspection (ADI) of the one or more critical dimensions; and, after-etching inspection (AEI) of the one or more critical dimensions.